

Minnesota, North Dakota, Oklahoma, and South Dakota. 28th, Colorado, Kansas, Minnesota, Missouri, Nebraska, and North Dakota. 29th, Alabama, Kansas, Nebraska, and Oklahoma. 31st, Iowa and North Dakota.

WINDS.

The prevailing winds for August, 1892, are shown on Chart II by arrows flying with the wind. In New England the winds were generally from the southwest; in the middle Atlantic states and along the south Pacific coast, from southwest to northwest; in the south Atlantic and Gulf states and over the southern plateau region, from southeast to southwest; over the Florida Peninsula and in the Missouri Valley, from east to south; in the upper Mississippi valley, from northeast to southeast; on the middle-eastern slope of the Rocky Mountains and over the northern plateau region, southerly; on the southeast slope of the Rocky Mountains, from south to west; on the north Pacific coast, from west to north; on the immediate middle Pacific coast, from west to northwest; and in the Sacramento Valley, from southeast to south. In the Ohio Valley and Tennessee, the Lake region, extreme northwest, on the northeast slope of the Rocky Mountains, and over the middle plateau region the winds were variable.

HIGH WINDS.

[In miles per hour.]

Wind velocities of 50 miles, or more, per hour were reported at regular stations of the Weather Bureau as follows: 12th, 50, e., at Moorhead, Minn. 13th, 56, s., at Fort Canby, Wash.; 54, ne., at Oklahoma City, Okla.; 52, n., at Sioux City, Iowa; 50, ne., at Dodge City, Kans. 14th, 52, ne., at Huron, S. Dak. 15th, 60, nw., at Mount Washington, N. H. 17th, 52, s., at Pensacola, Fla.

LOCAL STORMS.

1st.—At Monroe, N. C., a thunder, rain, and hail storm moved northeast in a path one-half mile in width at 5.30 p. m. A man was reported killed by lightning at Shelby, N. C. One man was killed and another injured by lightning at Greenwood, S. C. A man was reported killed by lightning at Columbus, Ohio. A severe wind, rain, and hail storm caused some damage in the southern part of Chicago, Ill. During a thunderstorm in the early morning lightning struck in several places in Grand Haven, Mich. At Fruitport, 7 miles northeast of Grand Haven, buildings were unroofed and trees blown down. A severe thunder and rain storm visited Orange, Tex., in the evening.

3d.—At North Liberty, N. Y., roofs and orchards were damaged during a thunder and hail storm. A schooner was struck by lightning at Savannah, Ga. At Toledo, Ohio, a thunderstorm from the west, with rain and hail, began at 7.40 p. m. and ended 11.40 p. m.; lightning struck in several places, and the electric car service was suspended for 30 minutes. A man was killed by lightning near Grand Haven, Mich. A thunder, rain, and hail storm in the afternoon caused damage about Kalamazoo, Mich. Damage by lightning was reported at Lansing, Mich. The northern counties of Minnesota were swept by a destructive wind and hail storm at night. Considerable damage of a minor character was caused at South Bend, Ind., by a thunderstorm.

4th.—A house was struck by lightning at Westminster, Vt.; damage \$1,000. Trees were struck by lightning at Royalston, Mass. Several barns about New Castle and New Carlisle, Ind., were struck by lightning and burned. A sandstorm, with some thunder and lightning, was reported in Maricopa county, Ariz., in the afternoon.

5th.—At Eastport, Me., a thunderstorm, with light hail for 30 seconds, began 8.30 and ended 10.30 a. m.; 4 houses were struck and 2 persons were stunned by lightning. During a thunderstorm in the afternoon 2 persons were killed by lightning near Boston, Mass. A heavy thunder and rain storm

moved northeast over Titusville, Fla., from 12.15 to 1.20 p. m.; the wind reached a velocity of 44 miles per hour in a southwest squall. Destructive thunderstorms were reported in southern Illinois. One person was reported killed by lightning at Two Rivers, Wis. A building was struck by lightning at Monroe, Wis. A severe storm visited Marshall, Minn., in the morning; 3 persons were seriously injured, and property was destroyed to the estimated value of \$3,500. A thunderstorm visited Red Wing, Minn., in the early morning; 2 houses near Red Wing were struck by lightning.

6th.—A thunder and hail storm occurred in the northern parts of Sullivan and Merrimack counties, N. H., damaging crops, etc., in a narrow path about 15 miles in length. At Rantoul, Ill., stock was killed during a thunderstorm.

7th.—A house was struck by lightning at Wilmington, N. C. Destructive hailstorms were reported in southern Minnesota. Damage was caused by lightning at Huron, S. Dak.

8th.—A number of persons were shocked by lightning at Parkersburg, W. Va. At Manistee, Mich., a severe thunderstorm began 9 a. m. and ended 10.30 a. m.; 1.67 inch of rain fell in 30 minutes, flooding streets. In the early morning 3 houses were struck by lightning and damage was caused by high wind at Saint Paul, Minn. Damage was caused by high wind at Minneapolis, Minn., in the early morning. At Lake Stay, Minn., several buildings were blown down during a thunder and hail storm. Several buildings were struck by lightning at Stillwater, Minn. Crops and buildings were damaged by hail about Lake Benton, Minn. A thunderstorm, with high wind, rain, and large hail, damaged grain about Canby, Minn. Hail damaged grain about Marshall and Saint Cloud, Minn. A child was killed by lightning in the morning near Green Bay, Wis. During a heavy rain and wind storm one person was killed and damage was caused to property near Depere, Wis. At Watertown, S. Dak., buildings were unroofed and crops damaged during a rain and hail storm. A house was struck by lightning at Sioux City, Iowa. Lightning struck in several places at Prescott, Ariz.

9th.—At Royalston, Mass., a house was struck by lightning. A thunderstorm, with heavy rain and high wind, visited Cohoes, N. Y., in the afternoon. A heavy rain and thunder storm occurred at Syracuse, N. Y., in the morning. Hail and high wind damaged crops about New Lisbon, N. Y. During a thunderstorm at night several buildings were struck by lightning at Dyberry, Pa. Two houses in Saint Louis, Mo., were struck by lightning in the afternoon. A thunderstorm injured crops about Fayette, Iowa. Stock was killed by lightning near Monticello, Iowa. One person was killed and another injured by lightning at Laporte, Iowa. At Topeka, Kans., a heavy rain and wind storm occurred in the early evening; the wind reached a velocity of 60 miles per hour from the southwest; one person was killed and much damage was caused to buildings.

10th.—Several buildings were struck by lightning at West Milan, N. H. A severe thunderstorm occurred at Albany, N. Y., in the evening. Heavy storms were reported in eastern New York, and a destructive cloudburst visited Wilkesbarre, Pa., in the afternoon. In the evening corn and wheat about Valentine, Nebr., were damaged by a thunder, rain, wind, and hail storm.

11th.—A number of persons were injured by lightning at Tilton, N. H. A cloudburst caused great damage in Chittenden county, Vt. An exceptionally severe thunder and rain storm occurred at night in Massachusetts and Connecticut; several persons were reported killed by lightning. A boy was stunned by lightning at Beverly, N. J. In the afternoon 2

houses were struck and 3 persons stunned by lightning at Knoxville, Tenn.

12th.—A heavy rainstorm, with some thunder, occurred at Manchester, N. H., in the early morning; streets and cellars were flooded. The storm was also severe over eastern Massachusetts. At Heath, Mass., one man was killed and another stunned by lightning. During a thunderstorm at Port Royal, S. C., 1.25 inch of rain fell in 30 minutes. A heavy thunder and rain storm occurred at Memphis, Tenn., in the evening; in the eastern suburbs bridges were washed away and street car traffic was suspended for several hours. At Moorhead, Minn., a thunderstorm began 8.30 p. m. and continued until after midnight; rain fell in torrents; the wind shifted from southeast to northeast and reached a velocity of 50 miles per hour; great damage was caused by hail north and east of Moorhead. Lightning killed stock and fired hay stacks north of Fargo, N. Dak. A church was struck by lightning at Sioux City, Iowa.

13th.—A wind and hail storm from the northwest unroofed buildings and damaged grain at Elkton, S. Dak. A house was struck by lightning at Buffalo, Kans. A destructive local storm was reported 16 miles northeast of Grapevine, Tex.; buildings were destroyed and cotton and corn damaged.

14th.—At Huron, S. Dak., a severe thunderstorm, with small hail, began in the early morning and ended at 8.30 a. m. At 8.30 a. m. the wind backed from southeast to northeast and reached a velocity of 50 miles per hour.

19th.—A heavy thunder, wind, and rain storm passed about 20 miles north of Ithaca, N. Y., in the evening, causing considerable damage. In the early afternoon a number of buildings were struck by lightning about Erie, Pa. Three men were killed by lightning at Union City, Ind. Lightning struck in several places at Olney, Ill.

20th.—A man was killed by lightning at Springfield, Mo. A number of buildings were wrecked by high wind at Springfield, Kans. Two men were killed and 3 men were badly injured by lightning near Grant, Nebr.

21st.—Three persons were shocked by lightning during a severe thunderstorm at Homer, La.

22d.—A destructive cloudburst was reported at Roanoke, Va.; one man was drowned; the streets were flooded to a depth of 3 to 5 feet, and the damage to property was estimated at \$100,000. Two persons were reported killed by lightning at Vernon, Tex. An exceptionally heavy rainstorm was reported at Fort Bowie, Ariz.

23d.—A heavy thunderstorm visited Augusta, Ga., in the afternoon; two buildings were struck by lightning. Heavy rain flooded streams on the western mountain slopes near Fort Stanton, N. Mex.

24th.—One person was killed by lightning near Wilming-

ton, N. C. At Erie, Pa., a thunderstorm continued from 3.10 p. m. until midnight; a house was struck by lightning. A house was struck by lightning at Pensacola, Fla. Near Thornville, Mich., a barn was struck by lightning and burned.

25th.—Exceptionally heavy rain fell in New York, except in the southeastern part of the state. At North Hammond, N. Y., 6.40 inches of rain fell in 24 hours. A report from Jamestown, N. Y., states that Chautauqua Lake rose 30 inches in 10 hours.

26th.—At Boston, Mass., rain began in the morning and continued until the early morning of the 27th, and the wind reached a velocity of 36 miles per hour.

28th.—A house was struck by lightning at Tampa, Fla. A thunderstorm occurred at New Orleans, La. A severe rain and hail storm moved east over the northern part of Morton county, Kans., in a path one mile in width, damaging buildings and leveling corn and grain.

29th.—A heavy hail, wind, and rain storm visited Evergreen, Ala. A man was killed by lightning near Abbeville, Ala. An unusually severe rain and thunder storm occurred at Mobile, Ala., in the evening. At Springfield, Ill., a building was struck by lightning in the evening. A man was killed by lightning at Sun Prairie, Wis. At Clarinda, Iowa, a church was struck by lightning and burned. A barn was struck by lightning and burned near Clarinda. At Concordia, Kans., high wind demolished frail buildings, and damage was caused by heavy rain in the early morning.

30th.—A man was killed by lightning at Columbia, Ala. High wind, reaching a velocity of 30 miles per hour at 8.45 p. m., and heavy seas prevailed at Grand Haven, Mich. A number of vessels were compelled to run into that port for shelter. In the evening a schooner was capsized 14 miles north of Manistee; the crew, consisting of 8 persons, were drowned, and the vessel was a total loss. At Detroit, Mich., the wind reached a maximum velocity of 33 miles per hour at 7.12 p. m.; a large steamer was lost 60 miles west of Whitefish Point, and passengers and crew, numbering 28 persons, were, with one exception, drowned. Disasters were reported at other points on the upper lakes.

31st.—A heavy rain and thunder storm prevailed at New Brunswick, N. J., from 12.15 to 1.10 p. m. At Wilmington, N. C., a thunderstorm began 12.13 p. m. and ended 2.30 p. m.; .40 inch of rain fell in 5 minutes, .68 inch in 10 minutes, and 1.10 inch in 20 minutes. After a short interval the storm recommenced and continued until after midnight; 2 houses were struck by lightning. At Pensacola, Fla., a house was struck by lightning. At San Antonio, Tex., a heavy rain and thunder storm began 6.20 and ended 9.05 a. m., during which time 3.20 inches of rain fell, and the temperature fell 22°; streams rose rapidly, causing considerable damage.

ATMOSPHERIC ELECTRICITY.

THUNDERSTORMS.

Description of the more severe thunderstorms reported for the month is given under "Local storms."

Thunderstorms were reported as follows: East of the Rocky Mountains they were reported in the greatest number of states, 35, on the 9th and 10th; in 32 on the 4th and 11th; in 20 to 30 on the 1st, 2d, 5th to 8th, 12th, 19th to 27th, and 29th; in 10 to 19 on the 3d, 13th, 14th, 16th, 17th, 18th, 28th, 30th, and 31st; and in 9 on the 15th.

East of the Rocky Mountains thunderstorms were reported on the greatest number of dates, 31, in Florida; on 20 to 30 in Alabama, Georgia, Iowa, Kansas, Louisiana, Michigan, Mississippi, Missouri, Nebraska, North Carolina, North Dakota, South Carolina, South Dakota, Tennessee, and Texas; on 10 to 19 in Arkansas, Connecticut, Illinois, Indiana, Mary-

land, Massachusetts, Minnesota, Montana, New Hampshire, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, Rhode Island, Vermont, Virginia, West Virginia, and Wisconsin. The only states or territories for which thunderstorms were reported on less than 10 dates were, the District of Columbia on 3, and Indian Territory on 4 dates.

West of the Rocky Mountains thunderstorms were reported in Arizona on the 1st, 2d, 4th to 9th, 13th to 23d, 25th, 27th, 29th, 30th, and 31st; in California on the 3d, 4th, 30th, and 31st; in Colorado on the 2d to 12th, 16th to 28th, and 31st; in Idaho on the 2d, 19th, and 24th; in Nevada on the 1st to 8th, 10th, 11th, 16th, 17th, 19th to 24th, 30th, and 31st; in New Mexico on the 3d to 24th, 26th, 27th, and 28th; in Utah on the 4th to 11th, and 17th to 24th; in Washington on the 3d, 4th, 10th, and 24th; and in Wyoming on the 4th, 6th, 8th, 9th, 19th, 21st, 22d, and 24th.